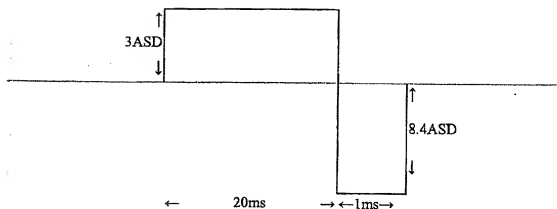


FIGURE 1

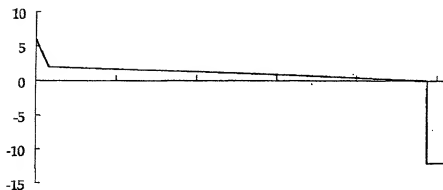
10026953-122701



Conditions - Square wave (with agitation)

| | |
|-------------------------|--------|
| Forward current density | 3ASD |
| Reverse current density | 8.4ASD |
| Forward current on time | 20ms |
| Reverse current on time | 1ms |
| Plating time | 80 min |

FIGURE 2



Conditions - Triangular wave 2ASD with 12ASD reverse current density (with agitation)

| | |
|-------------------------|---------------------------------|
| Triangular base height | 2ASD |
| Spike height | 4ASD |
| Spike width | 0.67ms |
| Spike distribution | At the start of forward current |
| No. of spike | 1 |
| Reverse current density | 12ASD |
| Forward current on time | 20ms |
| Reverse current on time | 1ms |
| Plating time | 315 min |

FIGURE 3

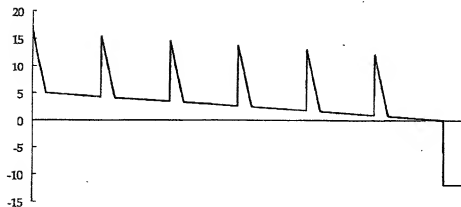
10026953-122701



Conditions - Triangular wave 2ASD with multi-peak and 12ASD reverse current density (with agitation)

| | |
|-------------------------|--------------------|
| Triangular base height | 2ASD |
| Spike height | 4.5ASD |
| Spike width | 0.67ms |
| Spike distribution | Evenly distributed |
| No. of spike | 6 |
| Reverse current density | 12ASD |
| Forward current on time | 20ms |
| Reverse current on time | 1ms |
| Plating time | 315 min |

FIGURE 4



Conditions - Triangular wave 5ASD with 11.25ASD multi-peak and 12ASD reverse current density 80min(with agitation and vibration)

| | |
|---|--------------------|
| Triangular base height | 5ASD |
| Spike height | 11.25ASD |
| Spike width | 0.67ms |
| Spike distribution | Evenly distributed |
| No. of spike | 6 |
| Reverse current density | 12ASD |
| Forward current on time | 20ms |
| Reverse current on time | 1ms |
| Plating time (with agitation and vibration) | 80 min |

FIGURE 5

















| | Throwing Power | | | | Microsection Photo | | | |
|--|----------------|--------|--------|-------|---|---|---|---|
| | 150 | 100 | 75 | 50 | 150 | 100 | 75 | 50 |
| Hole diameter(μ m) | | | | | | | | |
| Waveform 1 | | | | | | | | |
| Square wave (with agitation) | 73.18 | 75.64 | 68.24 | 50.35 |  |  |  |  |
| Waveform 2 | | | | | | | | |
| Triangular wave 2ASD with 12ASD reverse current density (with agitation) | 103.15 | 91.28 | 78.4 | 52.76 |  |  |  |  |
| Waveform 3 | | | | | | | | |
| Triangular wave 2ASD with multi-peak and 12ASD reverse current density (with agitation) | 129.13 | 135.59 | 125.54 | 70.52 |  |  |  |  |
| Waveform 4 | | | | | | | | |
| Triangular wave 5ASD with 11.25ASD multi-peak and 12ASD reverse current density (with agitation and vibration) | 94.42 | 82.32 | 84.55 | 70.52 |  |  |  |  |

TABLE 1

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